PHASE I ENVIRONMENTAL SITE ASSESSMENT

FEDERAL BUILDING #8
200 C STREET, SW.
WASHINGTON, D.C.

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ECC Project No. 98-3535

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF APPENDICES

1.0 Executive Summary

Environmental Consultants and Contractors (ECC), Incorporated, was authorized by Mr. Frank T. Thomas of the General Services Administration, NCR, WPT to perform a Phase I Environmental Site Assessment for the property identified as "Federal Building #8 (FB-8)," located at 200 C Street S.W. in Washington, D.C. The building was constructed in 1965 and has been primarily occupied by the Food and Drug Administration (FDA) for office, laboratory, and animal testing. The intent of this investigation was to identify suspected areas of contamination caused by usage since construction through records review, room by room inspection, and interviews of key personnel.

Based on the information gathered and reviewed during this Phase I Environmental Site Assessment, it is our professional opinion that several, but not all, of the items of concern from the provided scope of work will require additional investigation and testing to determine if a hazard is present or to support renovation or demolition project design. Issues of concern and recommended investigations are presented below. Unless presented below no additional action is required or recommended.

The Aerosol Monitoring and Analysis, Incorporated, asbestos inspection report, as provided to ECC, appears incomplete and will not support asbestos abatement project design necessary for renovation or demolition activities at FB-8. ECC recommends preparation of an asbestos inspection to document the locations and quantities of all ACMs in the building.

FB-8 was constructed prior to bans on the usage of lead-based paint. Lead-based paint inspection data, if any, was not available for ECC's review. ECC recommends the performance of a lead-based paint inspection prior to renovation or demolition to determine if lead-based paint is present. Facilities management reports that paint colors for each laboratory or office could previously be selected by the occupants. Therefore, any lead-based paint inspection undertaken should include room by room testing rather than a statistical sampling (i.e. HUD survey).

FB-8 facilities management reports that the dielectric fluids in sub-basement level transformers have been drained and replaced with non-PCB fluids. Residual PCB-containing dielectric fluid may have contaminated the non-PCB fluids. Only two additional transformers were observed in the building, both in room 1001. ECC recommends testing the dielectric fluid of all transformers at the site for PCB content.

Lighting fixtures throughout the majority of FB-8 have been recently replaced, and their ballasts likely will not contain PCBs. Older style lighting fixtures which might utilize PCB-containing ballasts were observed primarily in service and mechanical areas. ECC recommends inspection of light ballasts in older style fixtures prior to disposal. Ballasts in these fixtures should be assumed to contain PCBs unless labeled "non-PCB".

Flourescent light tubes may be classified as hazardous waste due to mercury content. Flourescent light tubes may be assumed to be hazardous waste or may be tested using TCLP. Additional investigation (an estimation of the number and types of flourescent tubes) should be performed to determine the cost-effectiveness of testing vs. assumption of flourescent tubes as hazardous waste.

Biohazardous materials residues in laboratories at FB-8 are generally not deemed to present a hazard to potential renovation or demolition workers or future occupants. However, environments conducive to microbial growth in certain components (ex. bio- and fume-hood filters, drain and vacuum line filters) present potential hazards. ECC recommends proper handling and decontamination of these components. However, no additional testing is required or recommended. A suggested protocol is presented in Section 6.

The usage and potential spillage of elemental mercury cannot be discounted in any of the laboratory spaces at FB-8. ECC recommends inspection for visible mercury contamination during renovation activities, particularly floor tile/baseboard removal, sink drain/trap dismantling and cabinet removal. Additionally, ECC recommends a mercury vapor meter inspection of all rooms where visible mercury is found and rooms with reported spills (rooms 4748, 4764, 4848 and 4856).

Although explosions resulting from residual perchlorate contamination are rare, dangers resulting from residual perchlorate contamination in any fume hood at FB-8 cannot be discounted. ECC recommends testing all fume hoods for perchlorate contamination prior to dismantling. Fume hood exhaust ducts and manifolds should also be considered perchlorate contaminated unless all of the hoods associated with a manifold test free of perchlorate contamination. A suggested list of priority testing is presented in Table 2. ECC recommends testing following the Oak Ridge field testing protocol.

Severe amounts of airborne particulate resulting from poor maintenance practices were previously discharged throughout FB-8 and have been characterized as non-hazardous urban dust. Current maintenance practices appear to have limited the generation of this particulate, although bag filters installed over supply air vents in many of the laboratories may conceal the current generation of particulate. Based upon observed particulate and reported air handler zones, ECC recommends cleaning metal- and flex-ductwork associated with air handler systems 4, 6, and 7 if these systems will remain following planned renovation.

Laboratory usage of amines, azides, and picric acid at FB-8 theoretically has the potential to produce explosive azide hazards in sink traps at FB-8. Piping of concern at FB-8 is limited to sink traps; pipe runs are constructed of non-reactive borosilicate glass. Laboratory sink trap construction could not be confirmed in several areas due to insulation with suspect asbestos-containing materials. The locations of drains or hoods with reported or suspected azide or nitro compound contamination are presented in Table 3. ECC recommends testing the sink traps and hoods listed in Table 3 for azide or nitro compound contamination. NIOSH Current Intelligence Bulletin 13, dated August 16, 1976 and entitled "*Explosive Azide Hazard,*" presents protocols for decontaminating azide contamination in lead

and copper piping. Prudent practices when repairing or dismantling fume hoods, sink drains, or storage cabinets should include careful handling, shielding, and restricted access.

A wide variety of highly toxic / carcinogenic substances have been used, albeit often in very small quantities, in most labs at FB-8. ECC deems it is neither feasible nor practical to accurately identify and sample for chemical-specific residual contamination on a lab-by-lab basis. ECC recommends decontaminating surfaces with potential toxic / carcinogenic contamination following a protocol presented in Section 6. Additionally, ECC recommends testing wash slurries from each room potentially contaminated with toxic substances. A listing of rooms potentially contaminated with toxic substances is highlighted in Table 4. If wash slurries test hazardous, ECC recommends post-decontamination testing of all potentially contaminated surfaces.

Toxic / reactive metals testing at FB-8 is not deemed likely to have generated residual contamination which might cause an aerosol or contact hazard to renovation / demolition workers. However, toxic metal accumulations on fume hood / ducting, sink traps / drains, and flooring may characterize these components as hazardous waste rather than construction debris for disposal purposes. ECC recommends screening all hoods / ducting, drains / traps listed in Table 5, to characterize these materials for disposal purposes.

The central vacuum system at FB-8 has the potential to contain hazardous or regulated materials. ECC recommends fluids contained within the moisture traps associated with this system be handled and disposed of as hazardous waste. Additionally, ECC recommends TCLP testing of the traps for disposal characterization.

2.0 Authorization and Scope of Investigation

Environmental Consultants and Contractors (ECC), Incorporated, was authorized by Mr. Frank T. Thomas of the General Services Administration, NCR, WPT to perform a Phase I Environmental Site Assessment for the property identified as "Federal Building #8," located at 200 C Street S.W. in Washington, D.C. Authorization was provided in GSA contract #P1198MM0315, dated August 11, 1998, with an attached scope of work prepared by ECC dated July 13, 1998.

The purpose of this Phase I Environmental Site Assessment was to identify suspected areas of contamination on the site caused by activities within the building since construction, with the intent to develop recommendations for additional investigation, including environmental sampling. Identified concerns to be addressed included:

- Asbestos contamination
- Lead paint contamination
- PCB contamination
- PCB in light ballasts
- Mercury in flourescent lights
- Radioactive contamination
- Mercury contamination
- Explosive perchlorate contamination in the fume hood exhaust system
- Antibiotic contamination
- Explosive amine buildup in the drainage systems
- Contamination from natural toxins and dyes
- Contamination from carcinogens and suspect carcinogens
- Acid contamination
- Animal dander contamination
- Air handler particulate
- Other unknown chemical residues

Methods of investigation to address these concerns included review of available records, a room by room inspection of the building, and interviews of personnel selected by GSA with relevant special knowledge or lengthy employment history. The building inspection was intended to:

- note present and historical (if possible) laboratory analysis performed,
- suspect asbestos-containing materials,
- suspect PCB-containing equipment or fixtures,
- equipment or fixtures indicative of previous or current hazardous materials usage with the potential to have caused or to have residual contamination (i.e. AAS, TEM, fume hoods, supplemental HVAC, etc.),

Interviews were intended to identify the location, dates, quantities, use of hoods/vents, drain disposal, storage, and incidents regarding strong oxidizers, carcinogens, biological materials, reactive/explosive materials, picric acid or sodium azide, elemental mercury, toxic / reactive metals, and lab animals with the potential for hazardous or regulated residues. Relevant comments from laboratory personnel were solicited during the inspection.

Please note that environmental sampling was not performed as part of this investigation.

3.0 Site Overview

Federal Building-8 (FB-8) is a steel and concrete structure constructed in 1965. The structure includes two subgrade levels, six above grade levels, and a mechanical penthouse. The structure contains approximately 490,000 square feet of floor space, excluding the mechanical penthouse. All of the above grade levels were constructed with provisions for laboratory usage. According to a GSA 1988 Building Evaluation Report, the facility was divided into approximately 30% office space, 35% non-animal laboratory space, 20% animal support space, and 15% service and support space.

The primary occupant of the building since construction has been the Food and Drug Administration (FDA), although other previous tenants include the Consumer Products Safety Commission and the EPA Pesticides Program. The components of FDA currently occupying the building include the Center for Food Safety and Applied Nutrition, the Center for Drug Evaluation and Research, the Consumer Products Safety Commission Pesticides Program, and the Office of the Commissioner.

The interior of the building is accessed via corridors extending north-south (corridors 1, 3, and 7) and corridors extending east-west (corridors 0, 4, and 8). Corridor 3 (the main hallway) divides the building into laboratory and office sections; laboratory facilities are located east of corridor 3 and office facilities are located west of corridor 3. Animal and higher-risk laboratories were located in the interior of the laboratory section, bounded by corridors 0, 3, 7, and 8. Corridor walls extend above drop ceilings to concrete decking and provide fire barriers.

Heating, ventilation, and air conditioning (HVAC) for the building is provided by single-pass dual air supply systems which supply hot and cold conditioned air to diffusers via several mixing units per zone. Steam produced off-site by the GSA is used for heating; air conditioning cooling towers are located on the rooftop. Zoning for the HVAC systems were designed to provide negative pressure isolation of office areas from laboratory areas and laboratory areas from animal and higher-risk laboratory areas; however, HVAC systems are currently out of balance. HVAC systems for the building core are supplemented by centrally-supplied perimeter coil units and by supplemental units in specific laboratories.

4.0 Resources

4.1 Document Review

The volume of documentation reviewed during this Phase I Environmental Site Assessment is sufficiently large to prevent incorporation of copies into this document. Copies are available upon request. A listing of documents reviewed is presented below.

Revised FB 8 facility architectural drawings (5/22/79), annotated 1994.

FB 8 facility architectural drawings (8/7/94).

FB 8 facility ventilation schematic drawings.

Kevric Company, Inc.: *Radiological Survey Report for CFSAN/FDA.* Silver Spring, Md.: Kevric Company, Inc., 1992.

Ecology Services, Inc: *FDA/CFSAN Audit Report.* Ecology Services, Inc., 1994.

Phillips, Charles C. et al: Returning Perchlorate-Contaminated Fume Hood Systems to Service Part 1. Survey, Sampling, and Analysis. *Appl. Occup. Environ Hyg. 9(7):*503-509 (July 1994).

Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory: *Perchloric Acid Contaminated Hood Decontamination Procedure Manual.* Oak Ridge, Tennessee: Oak Ridge National Laboratory, 1993.

Stewart, B., Clean Venture: *"Dioxin, Room 4430."* January 11, 1995. (Private Correspondence). M. Wright, FDA, 200 C St. SW, Washington, D.C. 20205.

Fetterman, J., Clean Venture: *"Dioxin Analytical for FB8 Room 4430."* (Private Correspondence). M. Wright, FDA, 200 C St. SW, Washington, D.C. 20205.

Aerosol Monitoring & Analysis, Inc.: *AHERA/ASHARA Inspection for ACM: FB #8, 2nd and C Streets, S.W., Washington, D.C.* (Unpublished Report). Aerosol Monitoring & Analysis, Inc.: Lanham, Md., May 12, 1995.

Biospherics, Inc.: *Preliminary Indoor Air Quality Assessment: Food and Drug Administration, 200 C Street, S.W., Washington, D.C. 20204.* (Unpublished Report). Biospherics, Inc.: Beltsville, Md. 20705, May 9, 1989.

Capers-Webb, R. and C. Huson, Apex Environmental, Inc.: "Analyses of Bulk Dust from the Sixth Floor." (Private Correspondence). D. Waddick, FDA, 200 C St. SW, Washington, D.C. 20205.

Department of Health and Human Services, Public Health Service, Carcinogens Safety Review Committee (CSRC): "Guidelines for Laboratory Use of Chemical Carcinogens." Washington, D.C., April 12, 1990. (Memo)

Havery, D.C. *Safety Action Plan for Use of Nitrosamines.* (Unpublished Report). FDA, 200 C St. SW, Washington, D.C. 20205.

Ember, Lois R.: Nitrosamines: assessing the relative risk. *C & EN*:20-26 (March 31, 1980).

4.2 Inspection Areas

Every room in FB-8 was accessed during this Phase I Environmental Site Assessment with the exception of rooms B728, B730, 1066, 1448, and 6826. These areas were unoccupied during the inspection and security and facilities management were unable to provide immediate access.

4.3 Personnel Interviewed

GSA and FDA selected employees with areas of special knowledge or lengthy employment history at the facility for interview. The persons interviewed during this Phase I Environmental Site Assessment included:

Name	Area of special knowledge
James Tanker	Nutritional research
Virginia Dunkel	Genetic toxicology research
Geraldine Mitchell	Nutritional research
Jeanne Rader	Perchloric acid digestion
Valerie Flournoy	CDER anti-microbial
Charlotte Brunner	CDER HX
Beth Calvey	IR lab
John Gecan	Micro evaluation
Regie Bennett	Micro research
Barbara McCardell	Virology assessment
Don Havery	Cosmetic technology
Sam Page	Natural toxins
Prem Dua	Pathology
Tom Collins	Animal work
Wayne Wamer	CPSC cosmetic toxicology
Paddy Wiesenfled	CPSC
Jim Zelinsky	Safety inspections

Martin Wright	All hazardous waste streams at site
Brian Williams	Radiation safety

Name	Area of special knowledge
Dorie Waddick	Chief of Safety - past history
Jackie Waugh	Facilities staff
Jim Sphon	Mass spec
Diane Summers	Facility history

5.0 Findings

5.1 Asbestos Contamination

Significant quantities of friable and non-friable asbestos-containing materials (ACMs) are located within FB-8. ECC representative Robert Cienki (Virginia asbestos inspector license number 3303-001952, expires 5/31/99) observed suspect asbestos-containing materials in nearly every room at FB-8. An AHERA / ASHARA inspection for ACM at FB - 8 has been performed by Aerosol Monitoring & Analysis (AMA). This report identified 165 asbestos-containing materials at FB - 8 but lacked information regarding locations and quantities of ACMs at FB - 8. Location, quantity, and condition information will be required to support asbestos project design activities prior to renovation or demolition. The AMA report was prepared from November, 1994 through March, 1995, and significant renovations have occurred since publication.

5.2 Lead Paint Contamination

Documentation regarding lead-based paint testing, if any, was not available for review. The structure was constructed in 1965, prior to bans on the usage of lead-based paint in residential settings. Ms. Jackie Waugh of facilities management reported that, until recently, the walls of all animal areas had been covered with sheet vinyl and that office occupants could select paint colors for their offices. Therefore, painting history throughout the structure is not homogenous. Additionally, acoustical ceiling tiles and light fixtures throughout nearly the entire structure have been replaced recently. No other renovations significant to the potential presence of lead-based paint in the structure were identified.

5.3 PCB Contamination

Mr. Jim Windsor, facility manager, reported that all of the transformers on-site had been drained and refilled with non-PCB dielectric fluids. ECC observed that transformers located in the sub-basement were surrounded by low concrete dykes. Stains indicative of cleaning of the concrete pads within these dykes were observed.

ECC also observed two small transformers in Room 1001, an electrical closet. One of these transformers appeared to be an older style and the other appeared relatively new, possibly a replacement for an older transformer. Staining was not observed under or adjacent to these transformers. No other transformers were observed at FB-8.

5.4 PCB in Light Ballasts

Flourescent light fixtures throughout nearly the entire facility have been recently replaced. These fixtures are deemed unlikely to utilize PCB-containing ballasts.

Older style fixtures were observed in rooms B319, B823, B066, B082, B400, B430, community management company (CMC) locker and storage rms, 6862A, 5412A, 4858A, 4718, 3846-3842, 3718, 3452, 3458, 3460, 3076, 3082, 2840, 2856, 2448, 2476, 1718, and nearly throughout the sub-basement. These fixtures may contain ballasts installed prior to 1978 and may contain PCBs. Ballast housings are required to have been stamped with a date code; ballasts manufactured post-1978 may be assumed to be non-PCB containing.

5.5 Mercury in Flourescent Lights

Flourescent light tubes may be classified as hazardous waste due to mercury content. Flourescent light tubes may be assumed to be hazardous waste or may be tested using TCLP; results in excess of 0.2 mg/L of mercury will classify the light tubes as hazardous waste for disposal purposes. TCLP results vary significantly by type of light tube. If testing is chosen, several tube types should be tested to potentially limit the quantity of hazardous waste generated. Note that CERCLA requires notifying the National Response Center if disposing of more than one pound (approximately 11,000 lamps) of mercury per day. Disposal costs (including packaging) are estimated to be $ 0.25 / foot.

5.6 Radioactive Contamination

Throughout the history of its occupancy of Federal Office Building 8, CFSAN / USFDA has used, stored and disposed of a variety of radioactive materials, including sealed sources and isotopes. The principal long half-life isotopes (>90 days) that have been used are tritium and carbon-14: the principal short-life isotope is phosphorus-32. The Radiation Safety Officer maintains detailed current records of sources, quantities, uses, leak testing, environmental meter and swipe contamination surveys, ongoing decontamination / decommissioning activities and radioactive waste chain-of-custody records.

To maintain its current Nuclear Regulatory Commission (NRC) License, FDA has conducted several comprehensive surveys for radioactive materials use, current and historical, since 1992. Kevric Company, Inc. and Ecology Services, Inc. conducted a walk-through inspection for radiological materials, with selected meter surveys and historical record review, in July/August 1992 (See Kevric report.) The inspection report indicated that radioactivity is most probably confined to those areas currently posted as radioactive materials use areas. In compliance with NRC licensing requirements, FDA developed a Decommissioning Funding Plan (DFP). In February, 1994, Ecology Services, Inc. conducted a room-by-room physical inventory and detailed records audit. (See ESI report.) This comprehensive survey has served as a baseline for current ongoing quarterly surveys and close-out surveys by the FDA Radiation Safety Officer.

5.7 Biological Contamination

FDA researchers have worked with a variety of microorganisms and biotoxins such as mycotoxins (aflatoxin), botulinum toxin, saxitoxin. (See Table 1) The majority of the work involved extremely small quantities of organisms in isolation, standards preparation work, and isolation and concentration of

toxins in microgram or less quantities. The work did not exceed Biosafety Level II requirements; therefore, the fresh organisms presented moderate or less hazard potential and the production of aerosols was unlikely. Even allowing for work which predates or otherwise is not in uniform compliance with Biosafety Level II practices, the long-term survival (i.e. >30-60 days) of *residual* quantities of viable organisms on dry room or dry ventilation system surfaces, capable of producing a contact or inhalation hazard during decommissioning activities, is not likely. The odds of significant viable and non-viable particle survival and proliferation in actively flushed plumbing components is also not likely. However, the presence of microbial growth is always a consideration in stagnant parts of the system where moisture may be trapped and conditions are conducive to growth. The careless dismantling of lines, traps, drains, tanks, filters and vacuum system components could present a contact, ingestion or inhalation hazard to workers. Closed areas such as storage rooms/freezers or lockers where biohazardous materials such as animal carcasses (Rooms 6631-6631-A), tissue cultures, etc. may have been stored could provide a low-level surface contact hazard.

Residual quantities of non-viable particles, such as spores from lab work or animal aerosols, are potential hazards only if large quantities capable of aerosolization are present and/or conditions for the growth and proliferation of viable organisms are present (e.g. wetness, favorable temperatures, organic nutrients, etc.). All biosafety cabinet filters, fume hood filters, drain and vacuum line filters from labs where biohazardous materials have been used/stored are potentially hazardous reservoirs.

There is no evidence of persistent moisture problems or animal particulate accumulations (dander, fur, feathers, excreta) in laboratory spaces, in the plenum space above the drop ceiling, local exhaust systems or the building exhaust system. Therefore, there is no reason to expect a potential biological hazard pathway from non-viable particulate aerosols generated during decommissioning activities. The biotoxins are capable of presenting a contact, ingestion or percutaneous toxic and/or carcinogenic hazard to researchers, if proper controls, work practices and protective equipment are not used. However, due to the extremely small quantities involved, the general water-solubility and unstable nature of the toxins outside biological systems, a *residual* hazard to decommissioning workers is extremely unlikely.

Table 1
FB-8 Biohazards

Labs	Comment
3054	E. Coli, Vibrio - protein purification
3068	Salmonella
3446	Cyclospora
3422	Vibrio, E.coli, Salmonella-enteric pathogens
3452	Campylobacter - molecular biology
3460	Vibrio. Shigella, Salmonella
3860	Salmonella
3428,3436,3470	Staphylococcus, Bacillus, Salmonella, Campylobacter, E. coli (0157:H7), C. botulinum, Listeria monocytogenes
3830, 3892, 3846	enteric pathogens (V. cholera, Salmonella, E. Coli, shigella) usually fixed
2058, 2066, 2058A	Bordatella bronchoseptica, Micrococcus lefens, S. epidermadis, E. coli, S. aureus, S. faecium
2052	E. coli, Salmonella, V. cholera, HAV, Norwalk virus enterotoxins-not purified nor concentrated
5860,5856	used by Microbiology prior to Chemistry - no information re specific agents, probably enteric pathogens, usually fixed
4474	mycotoxins (aflatoxins, deoxynivalenol, patulin, ochratoxin A)-small quantities for standards fumonisin-isolate and concentrate
2450/52 "pathogens suite"	yeast (Candida, Aspergillus), molds-Class III biosafety cabinet (glovebox)
3036,3046	Mycotoxin growth/extraction
3038	Salmonella
4842	aflatoxin, saxitoxin, demoic acid, ocadiac acid, brevitoxins -- non-volatile, water-soluble, non-aerosolized, surfaces cleaned regularly with NH4 Pfisteria
4472.4476	shellfish toxins storage
4th floor - 4456, 4440,4442,4450	Fusarium toxin - no human pathogens
6331-6331A	animal carcass storage
1056-A, 1055-A, 1062,1068,1768, 1772	aflatoxin, Salmonella, Saccharomyces

Labs	Comment
3472	Vibrio, Aeromonas, Salmonella-molecular biology
4454	aflatoxin and other mycotoxins-standards preparation fumonisins-large scale preparation for tox study washdown with hypocholorate solution
2832	aflatoxin - IR standards preparation
3458	Listeria
6074	Bio hood labeled decontaminated
6862A	Insectarium
3076, 3074	Insect incubators

5.8 Mercury Contamination

Elemental mercury has been used throughout laboratory spaces in thermometers, manometers, lipophilizer and McCloud gauges, etc. and as a reagent. Predictably, researchers report a number of historical spills throughout laboratory spaces ranging from broken thermometers (Room 4764) to larger spills. A large spill was reported in either or both Rooms 4848 and 4856. In addition, significant mercury contamination was found in Room 4748 and cleaned up approximately 10 years ago. Mercury beads have reportedly been found when baseboards and floor tiles have been removed during renovation. It is also likely that mercury may have been suctioned into the vacuum system and could be pooled in sink traps.

5.9 Explosive Perchlorate Contamination of Fume Hoods and Systems

Unstable salts and corrosion *residual* accumulation in hood exhaust systems from hot perchloric acid digestions/extractions may result in a fire and explosion hazard, especially when these systems are dismantled during decommissioning. Known and reported perchloric acid use is summarized in Table 2 and tends to cluster on Floors 1 and 4. Washdown hoods designed for perchloric acid work were installed in Rooms 1858 and 4858. Since perchloric acid use was common, its use in other hoods cannot be ruled out. Because residual perchlorate salts may create an extreme hazard, its use should be suspected in all lab hoods.

Table 2
FB-8 Perchlorates

Lab Hoods	Exhaust Fan	Comment
1858	24	$HClO_4$ "wash-down" hoods
4858(x2)	56	
4858	68	
1462	27	Posted Perchlorate Digestion in Hoods
1830	22	
1858	24	
4858	(no current hood)	
4764,4748	24	decontaminated
5772	24	low concentrations (0.1M) used to precipitate DNA (1980-1983)
1810, 4832, 4840, 4848	22	
2026	23	
1856,1860, 4856	24	
1076, 4716(x2)	25	
4456	27	
2034, 3036, 1862, 1866, 1822	??	

Fume hoods in rooms 2034, 3036, 1862, 1866, and 1822 are not listed in the hood fan system information list, dated 10/26/98, provided by FDA, and their exhaust manifold systems are unknown.

5.10 Explosive Amine Buildup in Drainage Systems

Amines, organic azides and nitrate, nitro and nitroso compounds may form explosive compounds when accumulating and interacting with other compounds in hoods and drains. Table 3 summarizes known and reported use of these compounds.

Table 3
FB-8 Explosive Amines / Nitro Compounds - Hoods / Drains

Lab No.	Comment
1464	sodium azide
3029, 4440, 4442, 4450 5032, 5036, 5444	picric acid
4066, 4074, 4082, 3068, 4716, 5864	picric acid, Coulter counter (5864), sodium azide
5760	picric acid-histology
3830, 3892, 3846	sodium azide-immunological agent component, lead citrate
1056A, 1055A, 1062, 1068, 1068A, 1768, 1772, 3852, 4840, 4856, 4858	nitrosamines
1860.1868,1876, 1884	diazomethane incident? -decontaminated?, N-nitrosodimethylamine?
5460	nitroso compounds-CPSC "RUSH" studies has been renovated into current hazardous waste facility
5836	fireworks sample storage
5856,5860,5868, 5872	fireworks testing-bench only flashpoint determinations
2858A&B	Appear to have been unsecure, secure, and explosion rooms (respectively)
5772, 5760	aromatic hydrocarbons, aromatic amines - percutaneous absorption studies
4066, 4074, 4082, 3068, 4078, 5864, 4716	synthesis and analysis of organic dyes - aniline, phenol, flourescein, 2-nitropropane, hexane, benzidine, aromatic amines, napthas
3060	aniline, azobenzidine, 4-aminobiphenyl, 4-aminoazobenzidine - chloroform extractions
4058, 4054, 4066, 4018	benzidine, aniline - standards preparation aromatic amines, 1,4-Dioxane - organic trace analysis, extractions
3060, 3044, 4880, 4884, 4464	1,4 - dioxane - standards preparation benzene, aromatic amines (<1 gm.) - chromatography
4434-4438	cyanides
basement, 821-B	dye storage?

Some sink traps at FB-8 were insulated with suspect asbestos-containing cementitious materials and their composition could not readily be observed. Drain piping at FB-8 is constructed with a borosilicate glass which will not react to produce explosive azide hazards.

NIOSH Current Intelligence Bulletin 13, dated August 16, 1976 and entitled "*Explosive Azide Hazard*", presents a protocol for decontaminating azide contamination from lead trap piping. This protocol recommends carefully siphoning all liquids from the trap, filling the trap with a 10% sodium hydroxide solution, allowing the solution to remain in the trap for 16 hours, and flushing the drain with water for at least 15 minutes. The procedure for decontaminating copper or copper alloy (brass) traps is similar but uses nitrous acid which must remain undisturbed for 24 hours, flushing, and repeating. Copper piping decontamination areas should be well ventilated as toxic oxide of nitrogen vapors may be produced.

Note that the Bulletin recommends careful handling of even decontaminated piping by informed maintenance personnel using shielding and restricted access.

5.11 Acid Contamination

Acid contamination of surfaces, particularly sheet metal ducting, may result in corrosion. However, such contamination/corrosion does not present a hazard to workers during decommissioning activities or have hazardous waste implications for construction debris.

5.12 Animal Dander Contamination

Approximately 20% of the building was allocated to animal support space, prior to the moving of animal research functions to Laurel, Maryland in 1990. Various laboratory animals including rats, mice, rabbits, quail and cats were housed in a separately ventilated vertical core in the facility and used in feeding study, toxicological and microbiological research. Although *residual* animal aerosols (dander, excreta, fur, feathers, bedding, etc.) could present an inhalation hazard to workers during decommissioning, there was no evidence of significant particulate accumulation in former animal spaces, in the plenum above the space's drop ceilings or in the exhaust air handlers and ducts which serve them. In the absence of visible particulate accumulations, the creation of hazardous aerosols or contact hazards is not likely. Areas where potentially infective, radiologically contaminated or decomposing carcasses were stored are addressed in the biohazards section and under the facility's radioactive materials decommissioning plan.

5.13 Air Handler Particulate

Severe amounts of non-respirable particulate have previously been discharged throughout FB-8 by the HVAC systems. An preliminary indoor air quality study performed by Biospherics, Incorporated, entitled "Food and Drug Administration," dated May 9, 1989, identified this particulate via electron

microscopy as essentially urban dust, considered a nuisance but not a hazard. This particulate reportedly resulted from previous poor maintenance practices which have been corrected.

ECC observed severe quantities of this particulate in isolated areas scattered across the building. These areas included rooms 1054, 1810, 3414, 4010, 5436, 5444, 5446, 5454, and 5468. Three air handling systems (4, 6, and 7) supply the areas where particulate was observed by ECC. ECC observed bag filters clipped to supply air vents in many of the laboratories at FB-8. These filters may conceal current particulate generation.

5.14 Antibiotics, Natural Toxins and Dyes, Carcinogens and Suspect Carcinogens, and other Chemical Residues

A number of highly toxic and/or carcinogenic agents, including antibiotics, antineoplastics, dioxins, PCB's, nitrosamines, organophosphate and organohalogen and n-methylcarbamate pesticides, herbicides, dyes, and organic solvents have been used throughout the labs, particularly the Floors 1,3, 4 and 5. The majority of these substances were used and contained carefully in very small quantities in detection analysis, standards preparation and dye synthesis work. Highly toxic/carcinogenic organic solvent residues have likely volatilized and should not present a *residual contamination hazard* during decommissioning activities.

However, there are notable exceptions in regard to dioxin, pesticide, herbicide, and dye work and chemical spills. These substances may leave non-volatile, not readily soluble toxic residues which could persist in the lab environment and could present a worker hazard or waste disposable problem during decommissioning. In a number of areas, these substances were used/spilled in significant quantity and may have been inadequately contained. The highly toxic and carcinogenic herbicide/defoliant 2,4,5 T was handled in powder form from gallon-size containers in the Room 1420 "diet rooms" as an animal diet additive. A mitigating factor, however, is that researchers report that quality assurance lab blanks do not indicate interference by environmental contaminants, such as pesticides.

In 1996, Clean Venture performed wipe sampling of selected surfaces of Rooms 4430-32 which indicated trace dioxin/chlorofuran contamination above the hazardous waste trigger level of 1 part per billion. Clean Venture then successfully decontaminated the room surfaces with a citrus cleaner washing. A large phenol spill reportedly occurred some time ago in the 700 corridor of Floor 5. A diazomethane/4-nitrosomethylene incident occurred some time ago in the 1800 corridor of Floor 1 and contamination was remediated. (Unable to confirm either incident with available documentation). A fire occurred in a third floor laundry storage area (Rm. 3748) several years ago causing significant damage to the room and an adjacent lab; the area has since been restored.

Fire toxicity testing was performed by CPSC personnel in lab 5876 and most likely generated highly toxic/carcinogenic thermal decomposition products, which may have contaminated lab surfaces, especially the hood/ducting. CPSC also performed fireworks testing for black powder content and

flashpoint. (See Section 9 for discussion of potentially explosive nitro contaminants.) Detonation studies were conducted in an outdoor facility distant from FB 8. (CPSC lead paint testing is discussed in Section 18. Metals.)

Although the majority of dyes involved were food and cosmetic grade and not highly toxic or carcinogenic, several carcinogenic dyes were present in some labs and there are a number of reports of dye spills and tracking. Many dye-contaminated building materials have since been cleaned and removed; any remaining should be obvious and were not observed during the building walk-through survey. Note that lab table tops were intermittently covered with teflon sheeting which may mask staining.

Due to the widespread use of a variety of highly toxic/carcinogenic substances in various labs over the years, albeit often in very small quantities, it is neither feasible nor practical to accurately identify and sample for chemical specific residual contamination on a lab-by-lab basis. Lab reassignments, building architectural changes and gaps in incident documentation also complicate this issue. Known and reported specific uses of toxic/carcinogenic substances are summarized in Table 4. As a practical matter, surfaces such as benchtops, cabinetry fume hoods/ducting, sinks, drain, traps, pipes and floors should be considered chemically contaminated in all labs/former animal rooms, storage lockers, refrigerator lockers, chemical storage cabinets/areas on Floors 1, 3, 4, 5 and any other location noted in Table 4. Areas of special concern, due to the nature of the substance, quantities used or high likelihood of contamination are highlighted.

Table 4
Highly Toxic Substances / Carcinogens Use

Labs	Comment
4450	**dioxins - mg. to gm. quantities stored and packaged for distribution, pg. to ug. quantities-preparation and use of standards**
4430	**dioxin decontamination in 1996. Current qc dioxin blanks ok.**
4424	**PCBs - repackage and waste disposal**
4442	**chemical storage room-dioxins? PCBs?**
4834, 4432, 4446, 4424	**dioxins, dibenzofurans - handling, storage and disposal**
4414, 4416, 4424, 4426, 4432, 4434, 4438, 4440, 4442, 4444, 4446, 4448, 4450, 4456, 4834	**organohalogen, organophosphorus, n-methylcarbamate pesticide residues - methods development and standards work qc blanks indicate no interference by environmental contaminants**
4410	**pesticides**
4456, 4440, 4444	**hydrazine , pentachlorophenol (PCP)**
4052, 4442, 4458	**chemical storage, radiological glove box**
1420, 1432	**2,4,5 T mixed in animal diet rooms, residue analysis**
1860	**DDT**

Table 4
Highly Toxic Substances / Carcinogens Use
(continued)

Labs	Comment
4840, 4856, 4858, 3852	nitrosamines
3772, 4840	1,4 - dioxane
4032	"high hazard lab" current nitrosamine storage - glovebox work
4418	herbicides - sludge analysis, gross quantities
4020	2,4, D
4024	2.4.5 T
4824, 4826, 4834, 4864B	dioxins
4444	pesticides, PCB's
4448	pesticide residue extraction - methyl Hg extraction
4810, 4818, 4826, 4834, 4440, 4432, 4424	organophosphate pesticides
4016	PCBs-fractionating
4842	former mass spec lab
Basement - Mass Spec Lab	mass spectroscopy
821-B	dye storage
1254, 1260	PCB-small quantity animal gavage study
3830, 3842, 3846	osmium tetroxide/arsenic formulated fixatives
5036, 5462, 5470	2,4,5 T/dioxins (dissolved in corn oil)-small quantities used in gavage studies: Violet dye - diet study: Red dye #2 - diet and gavage study-dyes mixed outside the lab building
1056A, 1055A, 1062, 1068, 1068A, 1768, 1772	nitrosamines, PCB's in ug quantities
1860, 1868, 1876, 1884	N-nitrosomethylamine incident? - decontamination?
1030, 1448	carcinogens
1876, 1881	carcinogens, mutagens
6028, 6036	urethane
2052	Adriamycin, Mitomycin C - small quantities in original containers
2082, 2086, 6854	antineoplastics
Floor 3	Mitomycin C, Ethidrium bromide
2026	Adriamycin, Daunorubicin, Dactinomycin,Mitomycin, Bleomycin, Idarubicin - potency testing by HPLC
2016	Adriamycin, Daunorubicin, Dactinomycin, Idarubicin, Mitomycin, Bleomycin - potency testing by HPLC

Table 4
Highly Toxic Substances / Carcinogens Use
(continued)

Labs	Comment
2032, 2034	Cisplatin - potency testing by HPLC
2058, 2062, 2066, 2074	antibiotics - microbiological research
2004	antibiotic storage
2732	chemical storage area
5772, 5760	aromatic hydrocarbons, aromatic amines - percutaneous absorption studies
5760	Psoralens
4066, 4074, 4082, 3068, 4078, 5864, 4716	synthesis and analysis of organic dyes - aniline, phenol, flourescein, 2-nitropropane, hexane, benzidine, aromatic amines, napthas
4764	chloramphenicol - known contamination= .3 ppb (background for standards) acylating agents - detection analysis
3060	aniline, azobenzidine, 4-aminobiphenyl, 4-aminoazobenzidine - chloroform extractions
4058, 4054, 4066, 4018	benzidine, aniline - standards preparation aromatic amines, 1,4-Dioxane - organic trace analysis, extractions
3060, 3044, 4880, 4884, 4464	1,4 - dioxane - standards preparation benzene, aromatic amines (<1 gm.) - chromatography
4434-4438	cyanides
basement	dye storage?
sub-basement	sample storage
5412, 5732, 5086	PCBs, dyes, color additives, antineoplastics - necropsy and processing of contaminated animal tissues
3444	Door labeled bio- and cancer-hazard; reported pathogen and antibiotic usage
3454	Reported previous radiological, pathogen, and antibiotic usage
2450, 2430, 2250A, 2254, 2462, 2262, 2266, 2274, 2474, 2463	Pathogen suite, all exhaust ducts HEPA filtered and negative pressure monitored, 3 bio-glove boxes, 2 walk-in coolers

Although the potential for generation of hazardous aerosols from residual contamination during decommissioning activities is low, contaminated surfaces may present a contact hazard to workers. In addition, contaminated surfaces may have to be segregated from other construction debris and disposed of as hazardous waste, if they cannot be acceptably decontaminated.

5.15 Toxic / Reactive Metals

The presence of toxic/reactive metals throughout the building is summarized in Table 5. Very small quantities of toxic metals have been present in labs on Floors 1 and 4 in the course of trace metal analysis and nutritional research. Testing for lead in paint was done on Floor 5. There is a history of silver staining in the photo labs on Floor 3. None of these uses is likely to have left a *residual* contamination that would generate a hazardous aerosol or contact hazard for workers during decommissioning. However, toxic metal accumulations on fume hood/ducting, traps/drains and flooring surfaces may have accumulated in quantities that would characterize the waste materials as hazardous waste rather than construction debris.

Table 5
Toxic / Reactive Metals

Labs	Comment
1420, 1800, 1432	nutrition research -trace mineral/metal analysis
4842	former mass spectroscopy lab
basement-mass spec lab (old kitchen)	
1056, 4456, 4778A, 4832, 4840, 4066, 4848, 4856, 4858B, 4872, 4874, 4856, 5044	AAS, ICP-AAS, ICP-mass spec
5860, 5864, 5868	lead in paint testing - AAS
5872	fire toxicity testing
4024, 4044	analysis of color additives
4456, 4440	analysis of pesticide residues
5852	mass spec lab
3053, 3056	history of silver staining on photo lab floors
1448A&B, 3022, 3052, 6050A, 6056,	Photo labs
3842-3846	TEM -uranyl acetate, photo lab

Lab table tops in many of the laboratories at FB-8 were covered with teflon sheeting. This sheeting may cover areas of contamination or staining which could not be observed during this survey.

5.16 Mechanical systems

Two mechanical systems at FB-8 desire special attention due to the potential for contamination hazardous to future renovation / demolition workers. These systems are the central vacuum system and the site incinerator.

5.16.1 Central Vacuum System

Equipment and central manifolds associated with the central vacuum system are located in the sub-basement adjacent to the compressor room. This system could potentially have been used to collect any of the myriad of regulated or hazardous substances used at FB-8; however, due to the minuscule quantities of most of the toxic, biohazardous, or carcinogenic compounds used at FB-8, the collection of these substances in the vacuum system is deemed unlikely. A notable exception to this estimation would be mercury.

Note that traps associated with the vacuum system might likely provide a suitable environment for the growth of micro-organisms (biohazards, molds, fungi).

5.16.2 Incinerator

Reportedly, the site pathological incinerator is a replacement which was installed in 1981. Since 1990 this incinerator has been used for disposal of medical waste, classified paper waste, and non-hazardous food additives. Prior to 1990 it was used for disposal of animal carcasses, litter, bedding, medical waste and classified documents.

Selenium contamination in the incinerator was decontaminated and in July, 1995, the incinerator passed TCLP screening. Potential radioactive contamination will be assessed and addressed by FDA according to the radiation decommissioning funding plan.

6.0 Conclusions and Recommendations

Based on the information gathered and reviewed during this Phase I Environmental Site Assessment, it is our professional opinion that several, but not all, of the items of concern from the provided scope of work will require additional investigation and testing to determine if a hazard is present or to enable project design suitable for renovation or demolition work. Issues of concern and recommended investigations are presented below.

The Aerosol Monitoring and Analysis, Incorporated, asbestos inspection report, as provided to ECC, appears incomplete and will not support asbestos abatement project design necessary for renovation or demolition activities at FB-8. This report lacks location and quantity information for ACMs at FB-8. Additionally, this report was published in 1995 and does not reflect renovations which have occurred during the interim. ECC recommends preparation of an asbestos inspection report to document the locations, quantities, and conditions of all ACM in the building.

FB-8 was constructed prior to bans on the usage of lead-based paint. Lead-based paint inspection data, if any, was not available for ECC's review. Painted surfaces at FB-8 were generally in good condition and therefore would be unlikely to present a hazard to occupants if they were covered with lead-based paint. However, lead-based paint, if present, could be classified as hazardous waste and may present a hazard to construction personnel during renovation or demolition. ECC recommends the performance of a lead-based paint inspection to determine if lead-based paint is present at FB-8. Note that facilities management reports that paint colors could previously be selected by occupants. This painting variability invalidates any inspection based upon statistical sampling (i.e. HUD standard survey). Any lead-based paint inspection undertaken should include room by room testing.

FB-8 facilities management reports that the dielectric fluid in sub-basement level transformers has been drained and replaced with non-PCB fluid. ECC observed staining of the concrete pads underneath sub-basement level transformers apparently indicative of cleaning associated with dielectric fluid draining. This staining was confined within concrete dykes surrounding each transformer. Residual PCB-containing dielectric fluid may have contributed sufficient PCBs to classify newly-installed fluid as PCB-containing. ECC observed transformers in only one other location, an electrical closet (room 1001). Two transformers were observed in Room 1001, one older and one apparently new. ECC recommends testing the dielectric fluid of all transformers at the site for PCB content.

Lighting fixtures throughout the majority of FB-8 have been recently replaced. Date of installation suggests that ballasts installed in these fixtures will not contain PCBs. Older style lighting fixtures were observed primarily in service and mechanical areas. Specifically, older-style fixtures were observed in rooms B066, B082, B319, B400, B430, CMC locker and storage rooms, 1718, 2476, 2448, 2856, 2840, 3082, 3076, 3460,3458, 3452, 3718, 3846-3842, 4718, 4858B, 5412A, 6862A, and nearly throughout the sub-basement. ECC recommends inspection of light ballasts in older style fixtures prior

to disposal. Ballasts in these fixtures should be assumed to contain PCBs unless labeled "non-PCB". Note that employees inspecting older-style fixtures should have appropriate training and equipment to deal with ballasts leaking potentially PCB-containing dielectric fluid.

Flourescent light tubes may be classified as hazardous waste due to mercury content. Flourescent light tubes may be assumed to be hazardous waste or may be tested using TCLP; results in excess of 0.2 mg/L of mercury will classify the light tubes as hazardous waste for disposal purposes. TCLP results vary significantly by type of light tube. If testing is chosen, several tube types should be tested to potentially limit the quantity of hazardous waste generated. Note that CERCLA requires notifying the National Response Center if disposing of more than one pound (approximately 11,000 lamps) per day. Disposal costs (including packaging) are estimated to be $ 0.25 / foot. Additional investigation will be required to determine the cost-effectiveness of testing vs. assumption of flourescent tubes as hazardous waste.

ECC's review of the *Radiological Survey Report for CFSAN / FDA* by Kevric Company dated 1992, and the *FDA / CFSAN Audit Report* by Ecology Services dated 1994, found these documents to be comprehensive and detailed. No additional investigation into radioactive contamination at FB-8 appears warranted.

Biohazardous materials residues in laboratories at FB-8 are generally not deemed to present a hazard to potential renovation or demolition workers or future occupants. However, environments conducive to microbial growth in certain components (ex. bio- and fume-hood filters, drain and vacuum line filters) do present potential hazards. ECC recommends:

- Remove filters from ventilation, plumbing and vacuum systems carefully, wet them, bag them, disinfect them by autoclaving and/or dispose of them as biohazardous waste.

- Wet down ventilation system components and ducting in all labs identified, otherwise not decontaminated, prior to removal and disposal to minimize the potential for any residual dust becoming an airborne hazard.

- Flush thoroughly with water and drain until dry vacuum system and waste water lines and components prior to removal.

- Disinfect with bleach solution (or equivalent) interior surfaces of closed storage lockers / freezers / rooms, where biohazardous materials such as animal carcasses, tissue cultures, etc. have been stored, prior to dismantling, removal or renovation.

The usage and potential spillage of elemental mercury cannot be discounted in any of the laboratory spaces at FB-8. ECC recommends visual inspection for mercury contamination exposed during renovation activities, particularly floor tile/baseboard removal, sink drain/trap dismantling and cabinet removal and survey for residual mercury vapor contamination in all rooms where visible mercury is found. Additionally, ECC recommends mercury meter inspection of all rooms where visible mercury is found and rooms with reported spills (rooms 4748, 4764, 4848 and 4856).

Although explosions resulting from residual perchlorate contamination are rare, dangers resulting from perchlorate digestion cannot be safely discounted in any fume hood at FB-8. ECC recommends testing all fume hoods for perchlorate contamination prior to dismantling. Fume hood exhaust ducts and manifolds should also be considered perchlorate contaminated unless all of the hoods associated with a manifold test free of perchlorate contamination. Assign priority to testing of hoods noted in Table 2. Use the Oak Ridge field testing protocol (testing of rinsate with ion specific electrode) or equivalent to determine which hoods require decontamination prior to dismantling.

Residual acid contamination of surfaces at FB-8 is not deemed to have implications for future renovation / demolition workers, occupants, or waste disposal. No additional investigation is recommended.

Accumulations of animal dander or other potential animal aerosols were not observed in former animal spaces, the return air plenum above drop ceilings, or exhaust air ducts or air handlers. No additional investigation is recommended.

Severe amounts of airborne particulate resulting from poor maintenance practices were previously discharged throughout FB-8. Current maintenance practices appear to have limited the generation of this particulate, although bag filters installed over supply air vents in many of the laboratories may mask the current generation of particulate. This particulate has been characterized as urban dust - a nuisance not a hazard - by indoor air quality studies at FB- 8 reviewed by ECC. ECC observed significant quantities of this dust in rooms supplied by air handlers 4, 6, and 7. ECC recommends cleaning metal- and flex-ductwork associated with these air handler systems if they will remain following planned renovations.

Laboratory testing of amines, azides, and picric acid at FB-8 theoretically has the potential to produce explosive azide hazards in sink traps. Piping of concern at FB-8 is limited to sink traps; pipe runs are constructed of non-reactive borosilicate glass. Laboratory sink traps were observed to be insulated with suspect asbestos-containing insulation and trap construction could not be confirmed. Reported or suspected azide or nitro compound contamination locations of drains or hoods are presented in Table 3. ECC recommends testing the sink traps and hoods listed in Table 3 for azide or nitro compound contamination. A NIOSH Current Intelligence Bulletin 13, dated August 16, 1976 and entitled "*Explosive Azide Hazard,*" presents protocols for decontaminating azide contamination in lead and

copper piping. Prudent practices when repairing or dismantling fume hoods, sink drains, or storage cabinets should include careful handling, shielding, and restricted access.

A wide variety of highly toxic / carcinogenic substances have been used, albeit often in very small quantities, in most labs at FB-8. ECC deems it is neither feasible nor practical to accurately identify and sample for chemical-specific residual contamination on a lab-by-lab basis. ECC recommends:

- consider surfaces such as benchtops, cabinetry, fume hoods / ducting, sinks, drain, traps, pipes and floors in all labs/former animal rooms, storage lockers, refrigerator lockers, chemical storage cabinets/areas on Floors 1, 3, 4, 5 as chemically contaminated. Consider dye-stained surfaces as chemically contaminated.

- Assign priority to areas of special concern highlighted in Table 4.

- Have laboratory surfaces decontaminated with a citrus-based cleaner (or the equivalent for non-highly water soluble substances) by a properly trained and equipped hazardous materials remediation contractor prior to disturbance and disposal. Handle all wash slurries as presumed hazardous waste.

Additionally, ECC recommends testing wash slurries from each room potentially contaminated with toxic substances. A listing of rooms potentially contaminated with toxic substances is highlighted in Table 4. If wash slurries test hazardous, ECC recommends post-decontamination testing of all potentially contaminated surfaces.

Toxic / reactive metals testing at FB-8 is not deemed likely to have generated residual contamination which might cause an aerosol or contact hazard to renovation / demolition workers. However, toxic metal accumulations on fume hood / ducting, sink traps / drains, and flooring may characterize these components as hazardous rather than construction debris for disposal purposes. ECC recommends screening all hoods / ducting, drains / traps listed in Table 5, to characterize these materials for disposal purposes.

The central vacuum system at FB-8 has the potential to contain hazardous or regulated materials. ECC recommends fluids contained within the moisture traps associated with this system be assumed to be hazardous. Additionally, ECC recommends TCLP testing the removed traps for disposal characterization.

The pathological incinerator at FB-8 passed a TCLP characterization in July, 1995, and has been used for disposal of non-hazardous wastes since. FDA plans testing for radioactive contamination; no additional testing is required or recommended.

7.0 Limitations

Our professional opinions and judgments have been made based upon the information gathered, our experience in the area with similar projects, and in accordance with generally accepted professional environmental practice under similar circumstances. Conditions observed and described at the subject property are representative of conditions at the specified location and on the specific date on which they were observed. The passage of time may result in changing conditions at the site location. Should additional information become available which would affect the status of this report, we reserve the right to amend our opinions and professional judgments.

The opinions and recommendations provided are based upon the type and extent of ECC's preliminary assessment. We would like to note that no sampling was performed due to the preliminary nature of this investigation.

Note that ECC does not believe that a complete listing of all potential areas of contamination at FB-8 is practical or possible. The listings presented in this report include all reported or suspected areas of contamination discovered within the provided scope of work and are expressly not intended to represent all potential areas of contamination.

Should you or designated users of this report have any questions or comments regarding the information contained herein, please feel free to contact this office at (703) 327-2900.

Sincerely,
for: ECC, Inc.

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APPENDIX A

FLOOR PLANS DELINEATING REPORTED OR SUSPECTED AREAS OF CONTAMINATION